

SAW MACHINE HAVING TWO SAW BLADES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a saw machine, and more
5 particularly to a saw machine having two or more saw blades driven
by different driving motors.

2. Description of the Prior Art

Typical saw machines comprise a single saw blade for cutting
work pieces. Normally, after the work pieces are cut by the saw
10 blade, a coarse side edge will be formed on the work pieces and may
hurt the workers and/or the users inadvertently.

In order to prevent the coarse side edges of the work pieces
from hurting the workers or the users, the coarse side edges of the
work pieces may have to be ground by the other sander or grinding
15 machines.

Accordingly, for some of the other typical saw machines may
provide an additional sander or grinding machine or tool member
beside the saw blade, for allowing the workers to easily grind the
coarse side edges of the work pieces with the additional sander or
20 grinding machine or tool member.

For example, U.S. Patent No. 2,913,025 to Richards discloses
one of the typical saw machines having an additional sander or
grinding machine or tool member provided and disposed beside the
saw blade, for grinding purposes.

25 However, after the cutting operations by the saw blades, the
work pieces should further be removed from the cutting or saw
machine, and to be engaged with the sander or grinding machine or

tool member for grinding purposes.

The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional saw machines.

SUMMARY OF THE INVENTION

5 The primary objective of the present invention is to provide a saw machine including a primary saw blade for cutting operation, and a secondary or auxiliary saw blade for trimming the coarse side edges of the work pieces right after the cutting operation with the primary saw blade, and including a support device to support the
10 driving axles of the primary saw blade and the secondary or auxiliary saw blade.

 In accordance with one aspect of the invention, there is provided a saw machine comprising a housing, a seat disposed in the housing, a first frame and a second frame each rotatably secured
15 to the seat with a pivot pin respectively, and each including a sector gear provided thereon, a first saw blade and a second saw blade attached to the first frame and the second frame respectively, means for driving the first saw blade and the second saw blade, a first
adjusting means for adjusting the first frame relative to the seat, and
20 a second adjusting means for adjusting the second frame relative to the seat.

 The first adjusting means includes a shaft rotatably secured to the seat, and a worm disposed on the shaft and engaged with the sector gear of the first frame, to rotate and adjust the first frame
25 relative to the seat with the shaft and the worm and the sector gear of the first frame. A support device is further provided to support the shaft on the seat, and includes a block having an orifice formed

therein to rotatably receive the shaft and to stably support and retain the shaft to the seat.

A board may further be provided and secured to the seat, and the block is secured to the board. A bracket may further be provided
5 and secured to the seat and the block is secured to the bracket. The bracket includes at least one oblong hole formed therein, and a fastener engaged through the oblong hole of the bracket and attached to the seat, to adjustably secure the bracket to the seat.

The bracket includes an arm having at least one oblong hole
10 formed therein, and a fastener engaged through the oblong hole of the arm of the bracket and attached to the block, to adjustably secure the block to the bracket. A hand wheel may be secured to the shaft and to rotate the shaft relative to the seat.

The second adjusting means includes a conduit rotatably
15 engaged on the shaft, a hand wheel secured to the conduit and to rotate the conduit relative to the seat. Two motors are coupled to the saw blades to drive the saw blades separately or respectively.

A rotating device may further be provided for rotating said seat relative to said housing, and includes a first and a second side plates
20 secured to the seat and rotatably attached to the housing, the first side plate includes a sector gear, a rod rotatably secured to the seat, and a worm disposed on the rod and engaged with the sector gear of the first side plate, to rotate and adjust the first side plate relative to the seat with the rod and the worm and the sector gear of the first
25 side plate. A hand wheel is secured to the rod and to rotate the rod relative to the seat.

A spring biasing device may further be provided for applying a

biasing force between the seat and the first frame, and/or another spring biasing device may further be provided for applying a spring biasing force between the seat and the second frame.

Further objectives and advantages of the present invention will
5 become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial perspective view of a saw machine in
10 accordance with the present invention, in which the outer housing of the saw machine is shown in dotted lines to show the inner structure of the saw machine;

FIGS. 2, 3 are partial exploded views of the saw machine; and

FIG. 4 is a partial plan schematic view of the saw machine,
15 illustrating the operation of the saw machine.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and initially to FIGS. 1 and 2, a saw machine in accordance with the present invention comprises a housing 10 including two fences 11 secured to two sides of the
20 housing 10 with such as fasteners 12 or by welding processes, or form integral with the housing 10. The housing 10 includes a semi-circular or curved track 13 provided on each of the sides or each of the fences 11 thereof.

As shown in FIGS. 1-4, a seat 20 is disposed in the housing 10
25 and located or arranged between the two sides or fences 11 of the housing 10, and includes two side plates 21 secured thereto. Each of the side plates 21 of the seat 20 includes a semi-circular or curved

channel 22 formed therein to slidably receive the corresponding semi-circular or curved tracks 13 of the housing 10, and thus to pivotally or rotatably secure the seat 20 within the housing 10.

One of the side plates 21 of the seat 20 includes a gear segment
5 or sector gear 23 formed or provided thereon. A rod 24 is rotatably secured or supported in the housing 10 and includes a gear or worm 25 disposed or provided thereon for engaging with the gear segment or sector gear 23 of the side plate 21 of the seat 20, and for rotating or adjusting the seat 20 relative to the housing 10. A hand wheel 27
10 is secured to the rod 24, to rotate or adjust the seat 20 relative to the housing 10 via the worm 25 and the sector gear 23.

Two motors 30, 31 are secured to the seat 20 with coupling members 32 and pivot pins 33, 34 respectively, such that the motors 30, 31 may also be rotated or adjusted relative to the housing 10
15 together with the seat 20. The pivot pins 33, 34 may be secured between two panels 28, 29 of the seat 20 (FIGS. 1-3), and are preferably arranged perpendicular to the longitudinal direction or axis 90 of the seat 20 (FIG. 1).

Two frames 40, 50 are rotatably secured to the housing 10 with
20 the pivot pins 33, 34 respectively, and two saw blades 41, 51 are rotatably secured to the frames 40, 50 with pivot poles 42, 52 respectively. The pivot poles 42, 52 are coupled to the motors 30, 31 with such as a gear transmission (not shown), a belt-and pulley coupling. For example, each of the pivot poles 42, 52 includes a
25 pulley 43 coupled to the pulleys 35 of the motors 30, 31 with a belt 37 respectively, for allowing the saw blades 41, 51 to be driven by the motors 30, 31 respectively.

Alternatively, the saw blades 41, 51 may also be coupled to either of the motors 30, 31, and driven by one of the motors 30, 31, instead of being driven by the motors 30, 31 separately.

As shown in FIG. 4, each of the frames 40, 50 includes a gear segment or sector gear 44, 54 formed or provided thereon. A shaft 45 is rotatably secured or supported in the seat 20, such as supported between the side plates 21 of the seat 20, and includes a gear or worm 46 disposed or provided thereon for engaging with the gear segment or sector gear 44 of the frame 40, and for rotating or adjusting the frame 40 relative to the seat 20. A hand wheel 47 is secured to the shaft 45, to rotate or adjust the frame 40 relative to the seat 20 via the worm 46 and the sector gear 44. The hand wheel 47 and/or the worm 46 and the sector gear 44 may thus be formed as an adjusting means or device to rotate or adjust the frame 40 and thus the saw blade 41 relative to the seat 20.

A conduit 55 is rotatably secured or supported in the seat 20, or rotatably engaged onto the shaft 45, and includes a gear or worm 46 disposed or provided thereon for engaging with the gear segment or sector gear 54 of the other frame 50, and for rotating or adjusting the frame 50 relative to the seat 20. A hand wheel 57 is secured to the conduit 55, to rotate or adjust the frame 50 relative to the seat 20 via the worm 56 and the sector gear 54. The hand wheel 57 and/or the worm 56 and the sector gear 54 may thus be formed as another adjusting means or device to rotate or adjust the frame 50 and thus the saw blade 51 relative to the seat 20.

A board 60 is secured to the seat 20, such as secured between the side plates 21 of the seat 20 with such as latches or fasteners 61.

A block 63 is secured to the board 60 with such as fasteners 64 and includes an orifice 65 formed therein to rotatably receive the shaft 45, and thus to stably support and retain the shaft 45 to the seat 20. It is preferable that the block 63 is engaged onto the middle portion
5 of the shaft 45, best shown in FIG. 4, in order to stably support and retain the shaft 45 to the seat 20, and to prevent the shaft 45 from being bent or distorted relative to the seat 20.

A bracket 70 may further be provided and secured to the seat 20, such as secured to one of the panels 28, 29 of the seat 20 with
10 such as fasteners 71. The bracket 70 may include one or more oblong holes 72 formed therein to slidably receive the fasteners 71, for allowing the bracket 70 to be adjusted relative to the seat 20 and to be adjusted relative to the board 60.

The bracket 70 further includes an arm 73 laterally extended
15 therefrom to engage with and to further stably support or retain the shaft 45 to the seat 20. The arm 73 of the bracket 70 includes one or more oblong holes 74 formed therein to slidably receive fasteners 75 respectively which may secure the block 63 to the arm 73 of the bracket 70, in order to further solidly secure the block 63 and thus
20 the shaft 45 to the bracket 70, and thus to the seat 20. The board 60 and/or the bracket 70 may thus be formed as a supporting means or device to support the shaft 45 and/or the conduit 55 relative to the seat 20.

As shown in FIGS. 2 and 3, a stop 80 is secured onto each of
25 the pivot pins 33, 34, and engaged or contacted with one of the panels 28, 29 of the seat 20, to limit the movement of the pivot pins 33, 34 relative to the seat 20, or to prevent the pivot pins 33, 34

from moving axially relative to the seat 20. Two further fasteners or lock nuts 81 are secured onto the pivot pins 33, 34, and two spring members 83 are engaged onto the pivot pins 33, 34, and engaged or secured between the seat 20 and the lock nuts 81 or the pivot pins 33, 34 respectively, to apply a spring biasing force or a recovering force against the pivot pins 33, 34 respectively.

It is to be noted that the primary saw blade 41 may be used for cutting work pieces, for example, and the secondary or auxiliary saw blade 51 may be used for trimming the coarse side edges of the work pieces right after the cutting operation with the primary saw blade 41. The shaft 45 and thus the conduit 55 may be solidly secured or supported to the seat 20 with the block 63 and the bracket 70 and/or the board 60.

Accordingly, the saw machine in accordance with the present invention includes a primary saw blade for cutting operation, and a secondary or auxiliary saw blade for trimming the coarse side edges of the work pieces right after the cutting operation with the primary saw blade, and includes a support device to support the driving axles of the primary saw blade and the secondary or auxiliary saw blade.

Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.